LESSON MAKER PRO

Data Shift Detectives

Track how one change affects a data set.

GRADE 6 · MA.6.DP.1.6

MA.6.DP.1.6 "Given a real-world scenario, determine and describe how changes in data values impact measures of center and variation."

NAME _____ DATE _____

WATCH THE CHANGES

When one of n data values changes by d, the mean changes by d/n. The range is greatest value minus least value, so it changes only when a least or greatest value changes. A median can change if the changed value moves the middle value to a new position.

WORKED EXAMPLE

The data values are 13, 17, 21, and 25. Change 25 to 33. How do the mean and range change?

1. Original sum: 13 + 17 + 21 + 25 = 76, so the mean is 76 / 4 = 19.
2. Original range: 25 - 13 = 12.
3. New sum: 13 + 17 + 21 + 33 = 84, so the new mean is 84 / 4 = 21.
4. New range: 33 - 13 = 20.

Answer: The mean increases by 2, from 19 to 21. The range increases by 8, from 12 to 20.

PRACTICE 6 problems

1 The data values are 5, 7, 9, and 11. Change 11 to 15. How do the mean and range change?

ANSWER _____

2 The data values are 3, 6, 6, 9, and 12. Change one 6 to 10. How do the median and range change?

ANSWER _____

3 The data values are 4, 4, 7, 10, and 13. Change one 4 to 8. How does the mean change?

ANSWER _____

4 The data values are 2, 8, 8, 8, and 14. Change 2 to 6. How do the median and range change?

ANSWER _____

5 The data values are 15, 19, 23, and 27. Add 3 to every value. How do the mean and range change?

ANSWER _____

6 A set of 6 data values has a mean of 10. One value changes from 7 to 13. What is the new mean?

ANSWER _____

APPLY IT Show your work

1 Ava tracks the number of pages she reads on five days: 4, 6, 7, 7, and 9. She finds that the first number was recorded incorrectly and should be 8. How do the mean and range change?

WORK SPACE

ANSWER _____

2 Five students rate a new game: 5, 6, 8, 8, and 9. One student corrects a rating from 5 to 10. How do the mean and range change?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A data set has 7 values, a mean of 12, and a range of 15. The least value is increased by 5, and it is still the least value. All other values stay the same. Describe how the mean and range change. Explain why.

WORK SPACE AND ANSWER

ANSWER KEY

Data Shift Detectives

GRADE 6 · MA.6.DP.1.6

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The data values are 5, 7, 9, and 11. Change 11 to 15. How do the mean and range change?	**The mean increases from 8 to 9. The range increases from 6 to 10.**
2	The data values are 3, 6, 6, 9, and 12. Change one 6 to 10. How do the median and range change?	**The median increases from 6 to 9. The range stays 9.**
3	The data values are 4, 4, 7, 10, and 13. Change one 4 to 8. How does the mean change?	**The mean increases from 7.6 to 8.4, an increase of 0.8.**
4	The data values are 2, 8, 8, 8, and 14. Change 2 to 6. How do the median and range change?	**The median stays 8. The range decreases from 12 to 8.**
5	The data values are 15, 19, 23, and 27. Add 3 to every value. How do the mean and range change?	**The mean increases by 3. The range stays the same.**
6	A set of 6 data values has a mean of 10. One value changes from 7 to 13. What is the new mean?	**11**

PART 2 · APPLY IT

1. **The mean increases from 6.6 to 7.4. The range decreases from 5 to 3.** The total increases by 4, so the mean increases by 4/5, or 0.8. The corrected data set is 6, 7, 7, 8, 9, so its range is 9 - 6 = 3.
2. **The mean increases from 7.2 to 8.2. The range stays 4.** The total increases by 5, so the mean increases by 5/5, or 1. The new least value is 6 and the new greatest value is 10, so the range is still 4.

CHALLENGE

The mean increases from 12 to 12 5/7 because the total increases by 5 and there are 7 values. The range decreases from 15 to 10 because the least value moves up 5 while the greatest value stays the same.

Accept equivalent fraction, mixed-number, or decimal forms for mean changes. For descriptions of range, accept either the change amount or the before-and-after ranges when both are correct.